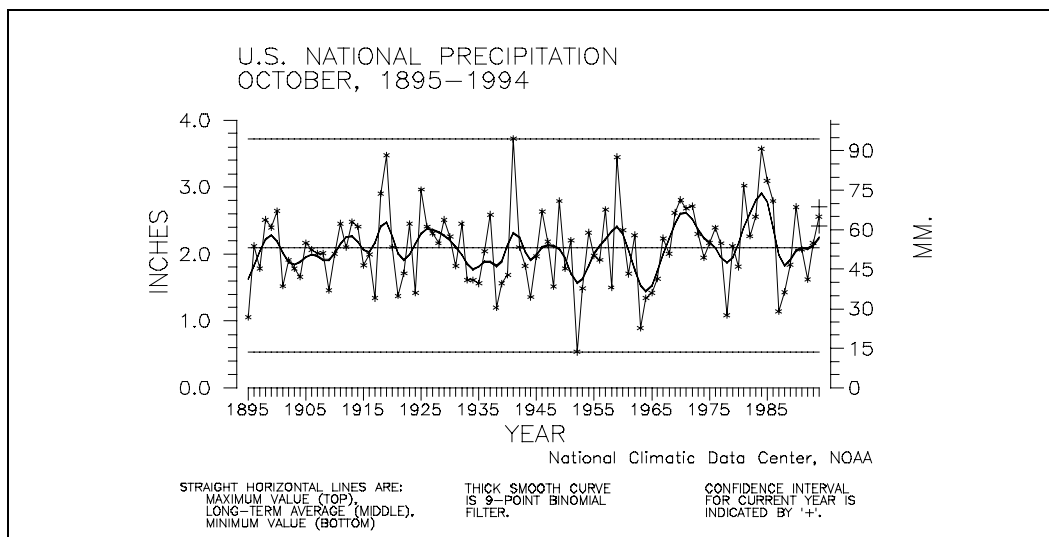
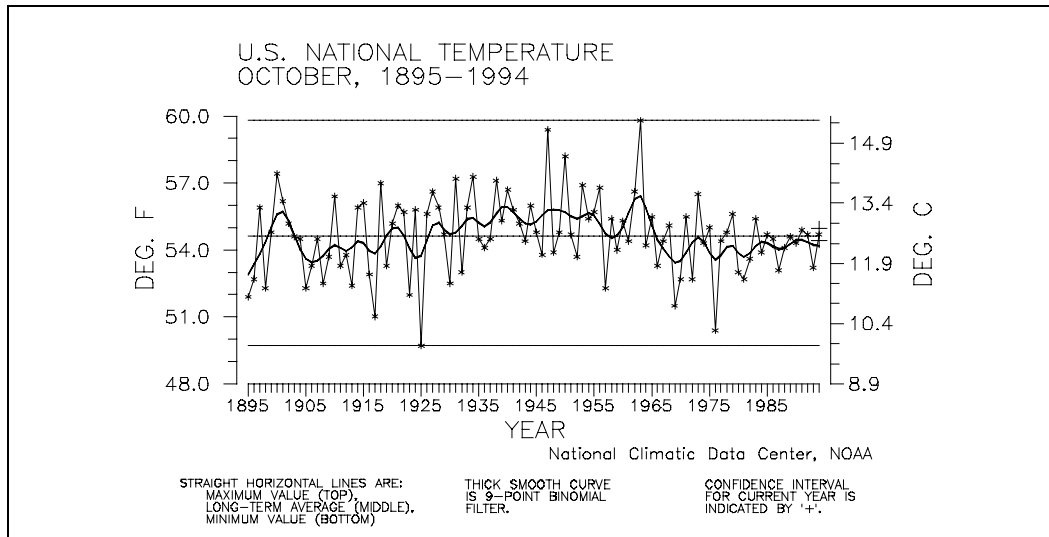


CLIMATE VARIATIONS BULLETIN



This CLIMATE VARIATIONS BULLETIN is a preliminary report that puts current monthly climate anomalies into historical perspective using climate databases archived at the National Climatic Data Center (NCDC). It is issued on a monthly basis. Supplemental sections are included which address seasonal and annual perspectives, when appropriate.

Current data are based on preliminary reports from First and Second Order airport stations obtained from the National Weather Service (NWS) Climate Analysis Center, and preliminary tornado statistics obtained from the NWS National Severe Storms Forecast Center. THE CURRENT DATA SHOULD BE USED WITH CAUTION. These preliminary data are useful for estimating how current anomalies compare to the historical record, however the actual values and rankings for the current year will change as the final data arrive at NCDC and are processed.

The following NCDC datasets are used for the historical data: the climate division drought database (TD-9640), the hurricane datasets (TD-9636 and TD-9697), the tornado dataset (STORM DATA), and the monthly station dataset (LCD supplemental files). It should be noted that the climate division drought database consists of monthly data for 344 climate divisions in the contiguous United States. These divisional values are calculated from the 6000+ station Cooperative Observer network.

The narrative, tables, and graphs in this BULLETIN are also available via automated facsimile. The previous month's summary can be obtained after the tenth of the month by dialing 704-271-4570 and selecting the appropriate menu codes. A touch-tone fax machine is required.

If you are a climate researcher and would like to order copies of the historical datasets used to make graphs of the type in this report, call 704-271-4994 or fax a letter to 704-271-4876 or mail a letter to the address given below, ATTN: Research User Services.

All other questions or requests for data should be made by calling 704-271-4800 or sending a fax to 704-271-4876 or by writing to:

National Climatic Data Center, NOAA
Mail Stop M2
Federal Building
37 Battery Park Avenue
Asheville, NC 28801-2733

If you use any of the information from this BULLETIN, please identify "National Climatic Data Center, NOAA" as the source.

UNITED STATES OCTOBER CLIMATE IN HISTORICAL PERSPECTIVE

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Global Climate Lab, Global Analysis Branch
Federal Building
Asheville, NC 28801 USA

Preliminary data for October 1994 indicate that temperature averaged across the contiguous United States was at the long-term mean (see Figure 1). October 1994 ranked as the 50th coolest October since national records began in 1895 with an averaged temperature of 54.7° (F). This compares to the records of 59.8° (F) in October 1963 and 49.7° (F) in 1925. The normal averaged temperature for the contiguous United States for October is 54.64° (F). The 1994 value is based on preliminary data, which has been shown to be within 0.26°F (0.14 C) of the final data over a 46-month period. This confidence interval is indicated in the figure by '+'. The darker smooth curve is a nine-point binomial filter that averages out the year-to-year fluctuations and shows the longer-term variations. Only 5.5% of the country averaged much cooler than normal while two percent of the country averaged much warmer than normal for October 1994.

Areally-averaged precipitation for the nation was above the long-term mean, ranking October 1994 as the 21st wettest October on record. The preliminary value for precipitation is estimated to be accurate to within 0.14 inches (3.56 millimeters) and the confidence interval is plotted in Figure 2 as a '+'. Nearly a fifth (18.8%) of the country experienced much wetter than normal conditions while 8.1% of the country was much drier than normal.

Historical precipitation is shown in a different way in Figure 3. The October precipitation for each climate division in the contiguous U.S. was first standardized using the gamma distribution over the 1931-90 period. These gamma-standardized values were then weighted by area and averaged to determine a national standardized precipitation value. These national weighted values were then normalized over their period of record. Negative values are drier and positive values are wetter than the mean. This index gives a more accurate indication of how precipitation across the country compares to the local normal (60-year average) climate. The national standardized precipitation

ranked October 1994 as the 39th wettest such month on record.

In order to show more of a historical perspective, the precipitation and temperature rankings for the periods October 1994, September-October 1994, May-October 1994, and November 1993-October 1994 for the nine climatically homogeneous regions, as well as the national rankings, are listed in Table 1.

The regional rankings for temperature for the month of October indicate that cooler than normal conditions were noted for the western quarter of the country (the Rockies and westward) while the central half of the country (Plains states and Ohio and Tennessee valleys) was warmer than normal. The Atlantic coastal region was near the long-term mean. October 1994 was the 27th coolest such month since 1895 for the Southwest region, 29th coolest for the Northwest region, and 33rd coolest for the West region. October 1994 was the 19th warmest such month for the East-North Central region. The average flow pattern for the month was a significant trough in the west, a notable ridge in the middle of the country and a secondary trough along the Atlantic seaboard. On at least four separate occasions an upper-level cut-off low pressure system lingered over the central and southern Rockies during the month of October. This allowed for the noted cooler than normal conditions in this portion of the country and at the same time allowed for warmer than normal conditions to develop ahead of the system in the plains region of the country and in turn, the near normal conditions in the east.

When the October rankings are compared to the September-October period, especially in the western regions of the country, we see some notable changes. September-October 1994 was the 23rd warmest such period for the Northwest region, the 38th warmest for the West region and the 48th warmest such two-month period for the Southwest region. The differences are even more obvious when the six-month and twelve-

month periods are researched. The six-month period, May-October, goes on record as the warmest such period for the Southwest region, the fifth warmest on record for the Northwest region and the sixth warmest since 1895 for the West region. In regions east of the Rockies, the pattern shift was not as noteworthy.

October 1994 was the fourth wettest such month on record for the West-North Central region, the ninth wettest such month for the Southeast region, and the fourteenth wettest for the South region. October saw continued dryness in both the Northeast (third driest) and West (25th driest) regions. The remainder of the country fell within the middle-third of the historical distribution.

Perhaps the most noteworthy change over time in rankings has occurred in the West-North Central region. After the 22nd driest November-October period and the 31st driest May-October period, the region has improved rainfall deficits enough to record the 26th wettest September-October period and the 4th wettest October since 1895.

National averaged temperature for the year-to-date is shown in Figure 4. Temperature for the ten-month period, January through October, was above the long-term mean ranking as the 21st warmest such period since 1895. Nearly one-third of the country (32.4%) had much warmer than normal conditions for the January-October period while only 1.6% averaged much cooler than normal.

In Figure 5, national averaged precipitation for January-October is shown graphically. January-October 1994 was the 49th driest such period since records began. Only seven percent of the country averaged much wetter than normal for the period while only 11.1% averaged much drier than normal. When the local normal climate is taken into account, January-October 1994 ranked as the 33rd driest such period since 1895 (Figure 6).

Figure 7 shows, in illustrative map form, the October 1994 temperature rankings for the 48 contiguous states. Eleven states were within the warm third of the historical distribution for the month of October, including eight located in the mid- and upper-Mississippi valley. Ten states were within the cool third of the historical distribution, all but two located in the western portion of the country. It was the first month in some time where no states were within the top ten warm or cool ranking.

October 1994 state ranks for precipitation are shown in Figure 8. It was the second driest October

since 1895 for Massachusetts and New Hampshire, third driest for Delaware, New Jersey, and Rhode Island, fourth driest for Pennsylvania and Vermont, fifth driest for New York, seventh driest for Connecticut, and the eighth driest October on record for Maine. An additional nine states were within the dry third of the historical distribution for October 1994. Seven states were with the top ten wet of the historical distribution for October including the wettest October on record for Georgia, third wettest for North Dakota, fourth wettest for South Dakota, sixth wettest for Montana and Texas, seventh wettest for Wyoming, and ninth wettest October on record for South Carolina. An additional eight states were within the wet third of the historical distribution. It should be noted that the October precipitation ranks are preliminary and should be used with considerable caution due to the high variability of precipitation on a small space and time scale.

Temperature and precipitation ranks for the ten-month period, January-October 1994 are shown in map form in Figures 9 and 10. Ten states, all in the western third of the country, experienced their tenth warmest or warmer January through October period. Included in this statistic was the second warmest such period for Utah, the third warmest for Idaho, fourth warmest for Washington and Wyoming, fifth warmest such period for Arizona, Nevada and New Mexico, sixth warmest on record for Oregon, seventh warmest for Colorado, and the tenth warmest January through October period since 1895 for California. Only two others (FL, MT) were within the warm third of the historical distribution. No states were within the top-ten cool ranking for the January-October period. Twenty states however, were within the cool third of the historical distribution. Two states had the tenth driest or drier January-October period including the seventh driest such period since 1895 for Idaho and the ninth driest for Wyoming. Thirteen others were within the dry third of the historical distribution. It was the fifth wettest year-to-date for Georgia and Tennessee, eighth wettest for West Virginia and Pennsylvania, and the ninth wettest for Alabama. Sixteen other states were within the wet one-third of the historical distribution for the January-October.

There was a slight increase in the national picture of severe to extreme long-term wet spell and a moderate decrease in the percentage of the country experiencing severe to extreme long-term drought. Nationally, long-term drought conditions (as defined by the Palmer Drought Index), for October (this begins a new Hydrologic Year), decreased to 14.5% of the country while the percent coverage of severe to extreme wet area increased to just under twelve percent (Figure 11). Table 2 lists the precipitation ranks and statistics

for selected river basins for the 1993-94 Hydrologic Year thus far. The core wet areas included portions of the northern Great Plains, the Tennessee valley, and the interior South. The core dry areas included much of the country from the Rocky Mountains to the Pacific coast as well as portions of the central and southern Plains.

Table 3 shows extremes, 1961-90 normals, and the October 1994 values for both precipitation and temperature for the nine regions and the contiguous U.S.

Precipitation averaged across the Primary Hard Red Winter Wheat Belt ranked slightly below normal for the beginning of the growing season. October 1994 made eight consecutive Octobers of below to much below normal precipitation (Figure 12).

Figure 13 graphically shows the October precipitation for the Northeast region. October 1994 was the third driest such month for this region. It was only four years ago that the Northeast region had their wettest October on record.

Figure 14 shows October precipitation for the West-North Central region. October 1994 was the 4th wettest such month for the region since 1895.

East-North Central region temperature for October is depicted in Figure 15. October 1994 was the 19th warmest October since 1895.

It was the 27th coolest October on record for the Southwest region of the United States (Figure 16). The mean temperature for the region was nearly identical to that of October 1993.

According to preliminary data from the National Weather Service's National Severe Storms Forecast Center, there were 37 tornadoes across the contiguous United States in October 1994. The 1953-1993 average tornado count for October is 24. The extremes for October are 1 in 1987 and 55 in 1993. For the year-to-date, 1036 tornadoes have been documented compared with the 41-year average of 744. The year-to-date extremes are 388 in 1953 and 1149 in 1993. It should be noted that the preliminary tornado count is generally higher than the final count.

TABLE 1. PRECIPITATION AND TEMPERATURE RANKS, BASED
ON THE PERIOD 1895-1994. 1 = DRIEST/COLDEST,
100 = WETTEST/WARMEST FOR OCT 1994,
100 = WETTEST/WARMEST FOR SEP-OCT 1994,
100 = WETTEST/WARMEST FOR MAY-OCT 1994,
99 = WETTEST/WARMEST FOR NOV 1993-OCT 1994.

REGION	OCT 1994	SEP-OCT 1994	MAY-OCT 1994	NOV 1993- OCT 1994
-----	----	-----	-----	-----
PRECIPITATION:				
NORTHEAST	3	10	48	78
EAST NORTH CENTRAL	47	50	56	38
CENTRAL	43	17	19	58
SOUTHEAST	92	80	93	86
WEST NORTH CENTRAL	97	75	31	22
SOUTH	87	63	53	48
SOUTHWEST	53	53	28	20
NORTHWEST	65	47	25	5
WEST	25	17	16	3
NATIONAL	80	41	42	37
TEMPERATURE:				
NORTHEAST	50	39	53	21
EAST NORTH CENTRAL	82	88	65	34
CENTRAL	63	45	23	26
SOUTHEAST	47	24	12	35
WEST NORTH CENTRAL	48	89	89	76
SOUTH	60	37	47	42
SOUTHWEST	27	53	100	92
NORTHWEST	29	78	96	91
WEST	33	63	95	87
NATIONAL	50	69	80	69

TABLE 2.

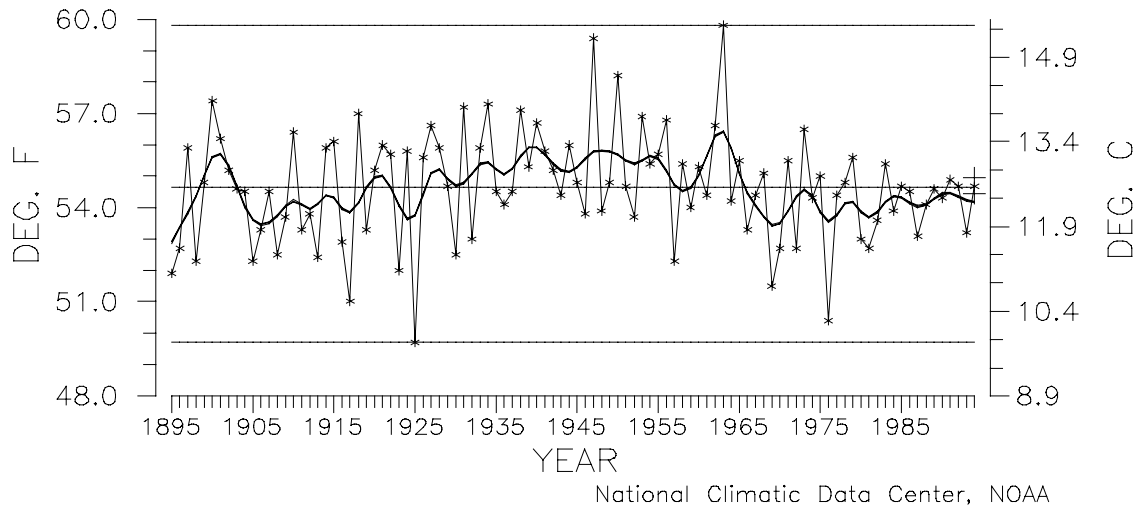
STATISTICS FOR SELECTED RIVER BASINS: PRECIPITATION RANKING FOR OCTOBER 1994, WHERE RANK OF 1 = DRIEST, 100 = WETTEST, BASED ON THE PERIOD 1895 TO 1994, AREAL PERCENT OF THE BASIN EXPERIENCING SEVERE OR EXTREME LONG-TERM (PALMER) DROUGHT, AND AREAL PERCENT OF THE BASIN EXPERIENCING SEVERE OR EXTREME LONG-TERM (PALMER) WET CONDITIONS, AS OF OCT 1994. RIVER BASIN REGIONS AS DEFINED BY THE U.S. WATER RESOURCES COUNCIL.

RIVER BASIN -----	PRECIPITATION RANK -----	% AREA DRY -----	% AREA WET -----
MISSOURI BASIN	89	13.6%	13.6%
PACIFIC NORTHWEST BASIN	69	58.8%	.0%
CALIFORNIA RIVER BASIN	29	42.3%	.0%
GREAT BASIN	45	78.8%	.0%
UPPER COLORADO BASIN	43	30.3%	.0%
LOWER COLORADO BASIN	31	16.8%	.0%
RIO GRANDE BASIN	74	29.4%	.0%
ARKANSAS-WHITE-RED BASIN	49	.0%	.0%
TEXAS GULF COAST BASIN	99	.0%	25.3%
SOURIS-RED-RAINY BASIN	94	.0%	51.4%
UPPER MISSISSIPPI BASIN	59	.0%	22.6%
LOWER MISSISSIPPI BASIN	86	.0%	13.3%
GREAT LAKES BASIN	16	.0%	23.4%
OHIO RIVER BASIN	23	.0%	9.8%
TENNESSEE RIVER BASIN	75	.0%	81.4%
NEW ENGLAND BASIN	5	.0%	1.6%
MID-ATLANTIC BASIN	6	.0%	11.2%
SOUTH ATLANTIC-GULF BASIN	96	.0%	38.8%

TABLE 3. EXTREMES, 1961-90 NORMALS, AND 1994 VALUES
FOR OCTOBER

REGION	PRECIPITATION (INCHES)					
	DRIEST		WETTEST		NORMAL	1994
	VALUE	YEAR	VALUE	YEAR	PCPN	PCPN
-----	-----	-----	-----	-----	-----	-----
NORTHEAST	.44	1924	6.27	1990	3.35	1.11
EAST NORTH CENTRAL	.25	1952	4.66	1984	2.47	2.14
CENTRAL	.53	1963	7.15	1919	3.04	2.51
SOUTHEAST	.53	1963	7.33	1959	3.16	5.24
WEST NORTH CENTRAL	.13	1952	2.72	1946	1.09	2.13
SOUTH	.12	1952	7.07	1984	2.89	4.49
SOUTHWEST	.02	1952	3.67	1972	1.12	.91
NORTHWEST	.14	1987	5.20	1950	2.05	2.54
WEST	.01	1917	2.86	1962	1.01	.40
NATIONAL	.54	1952	3.72	1941	2.16	2.56
REGION	TEMPERATURE (DEGREES F)					
	COLDEST		WARMEST		NORMAL	1994
	VALUE	YEAR	VALUE	YEAR	TEMP	TEMP
-----	-----	-----	-----	-----	-----	-----
NORTHEAST	42.7	1925	56.0	1947	48.9	49.5
EAST NORTH CENTRAL	37.5	1925	57.6	1963	47.8	50.8
CENTRAL	48.2	1917	62.9	1947	55.2	56.8
SOUTHEAST	58.2	1987	72.8	1919	63.4	63.7
WEST NORTH CENTRAL	35.5	1925	53.9	1963	45.9	46.2
SOUTH	56.7	1976	69.9	1947	63.4	64.4
SOUTHWEST	48.6	1984	59.4	1950	53.4	52.0
NORTHWEST	42.3	1919	53.9	1988	47.7	46.7
WEST	51.8	1916	62.1	1988	56.9	55.6
NATIONAL	49.7	1925	59.8	1963	54.4	54.7

U.S. NATIONAL TEMPERATURE OCTOBER, 1895-1994



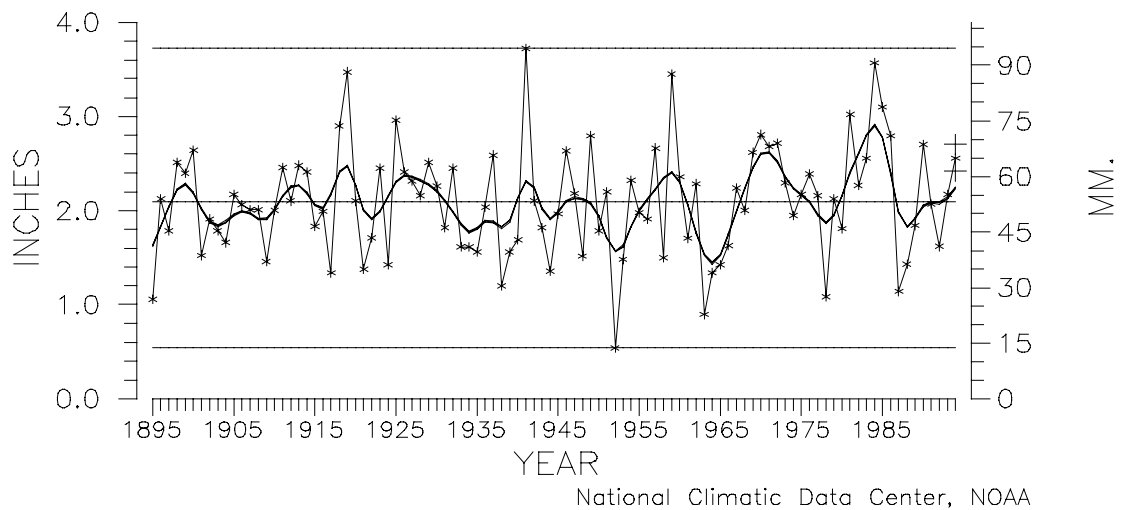
STRAIGHT HORIZONTAL LINES ARE:
MAXIMUM VALUE (TOP),
LONG-TERM AVERAGE (MIDDLE),
MINIMUM VALUE (BOTTOM)

THICK SMOOTH CURVE
IS 9-POINT BINOMIAL
FILTER.

CONFIDENCE INTERVAL
FOR CURRENT YEAR IS
INDICATED BY '+'.
+

Figure 1

U.S. NATIONAL PRECIPITATION OCTOBER, 1895-1994



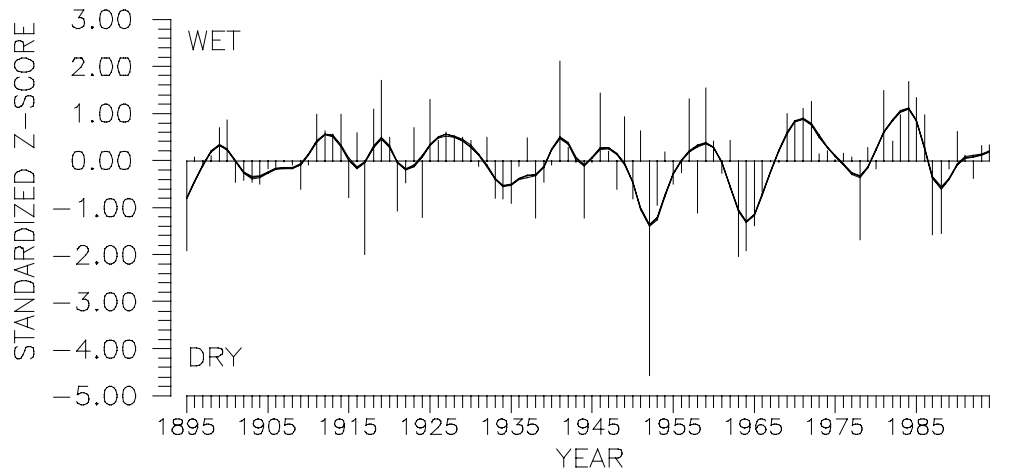
STRAIGHT HORIZONTAL LINES ARE:
MAXIMUM VALUE (TOP),
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MINIMUM VALUE (BOTTOM)

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FILTER.

CONFIDENCE INTERVAL
FOR CURRENT YEAR IS
INDICATED BY '+'.
+

Figure 2

U.S. NATIONAL NORMALIZED PRECIPITATION INDEX OCTOBER, 1895-1994

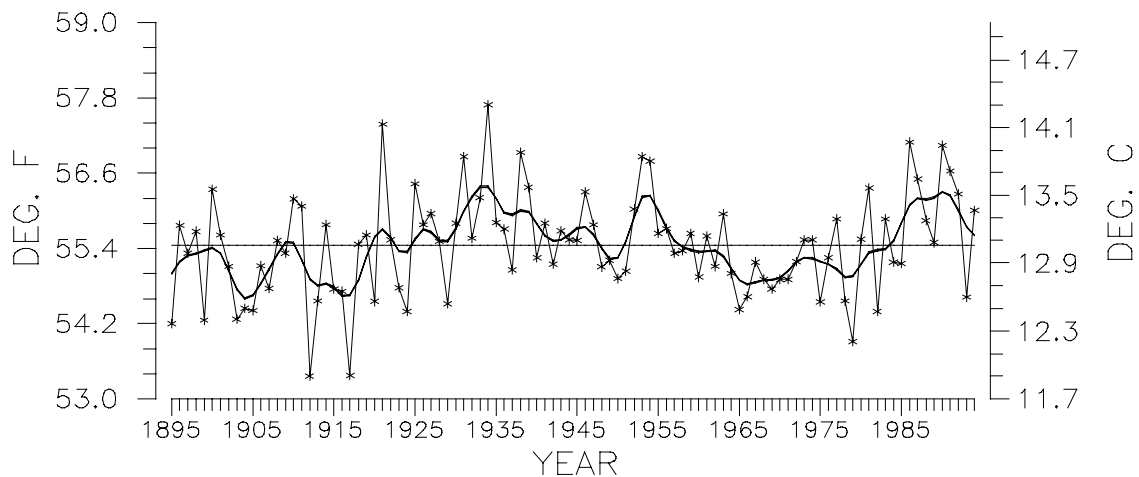


National Climatic Data Center, NOAA

THICK SMOOTH CURVE
IS 9-POINT BINOMIAL
FILTER.

Figure 3

U.S. NATIONAL TEMPERATURE JANUARY-OCTOBER, 1895-1994

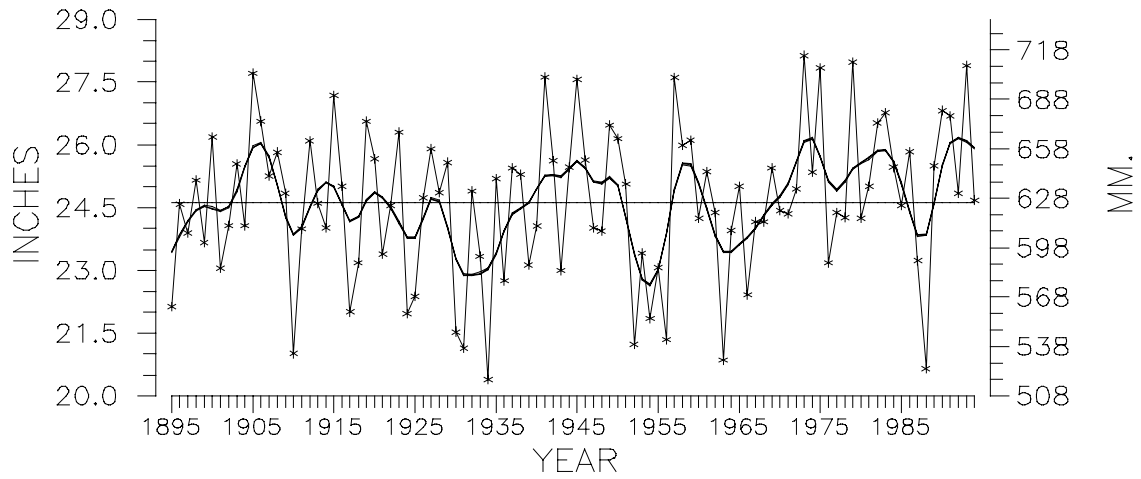


National Climatic Data Center, NOAA

THICK SMOOTH CURVE
IS 9-POINT BINOMIAL
FILTER.

Figure 4

U.S. NATIONAL PRECIPITATION JANUARY–OCTOBER, 1895–1994

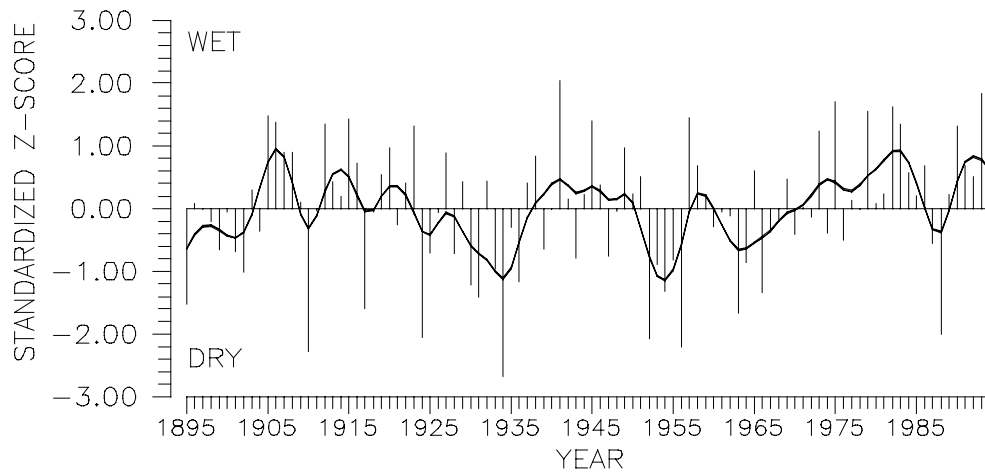


National Climatic Data Center, NOAA

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IS 9-POINT BINOMIAL
FILTER.

Figure 5

U.S. NATIONAL NORMALIZED PRECIPITATION INDEX JANUARY–OCTOBER, 1895–1994

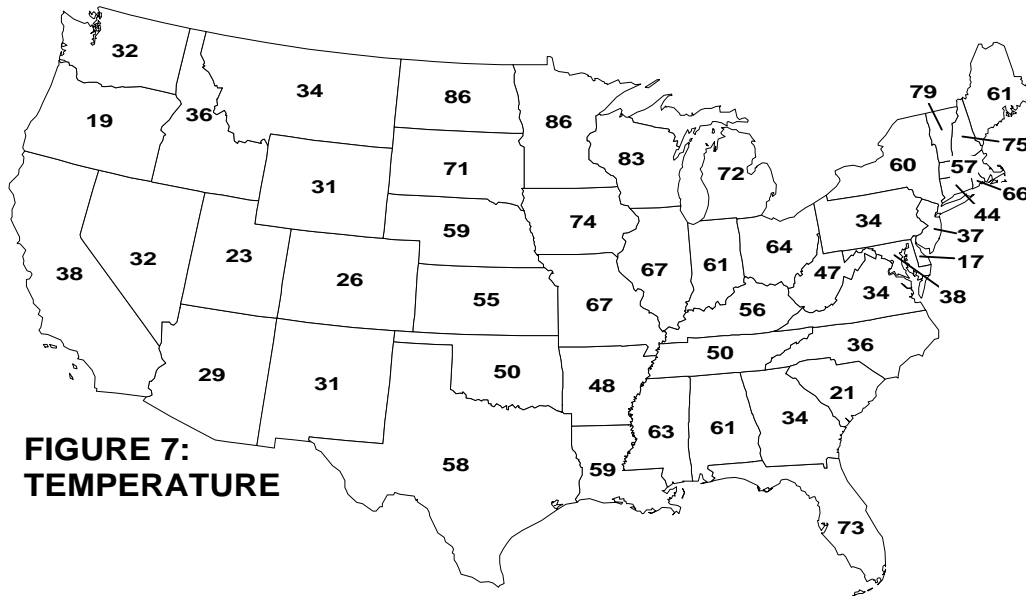


National Climatic Data Center, NOAA

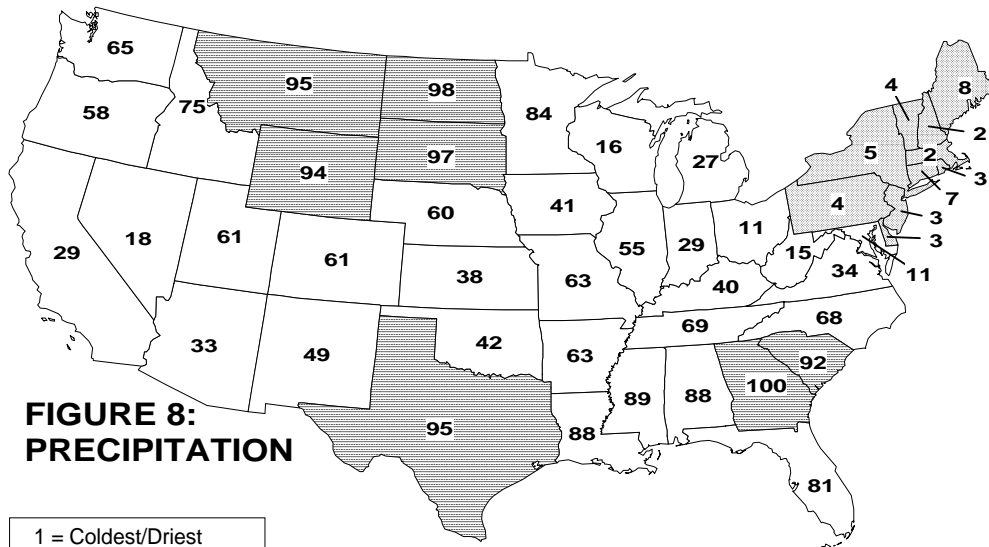
THICK SMOOTH CURVE
IS 9-POINT BINOMIAL
FILTER.

Figure 6

OCTOBER 1994 STATEWIDE RANKS



**FIGURE 7:
TEMPERATURE**



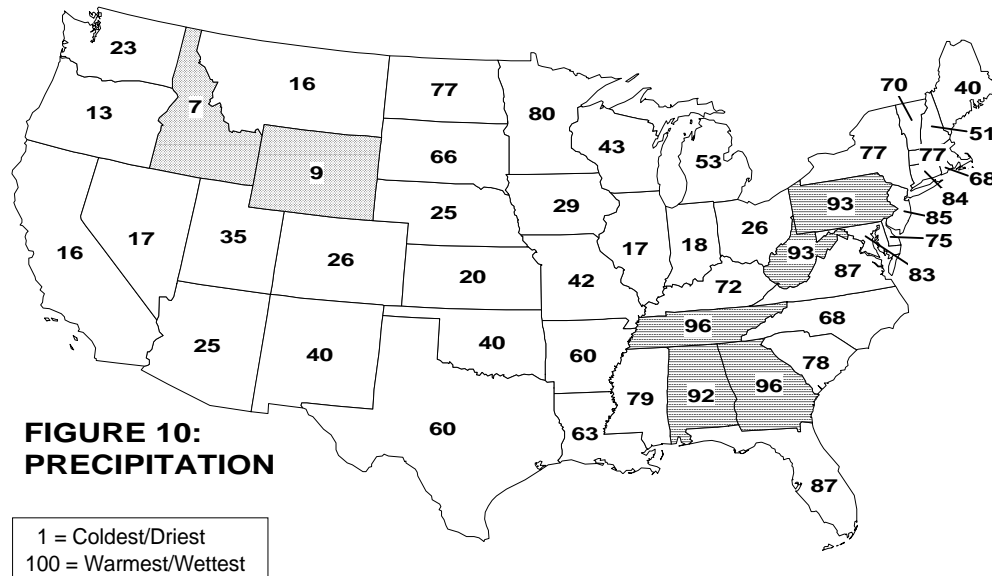
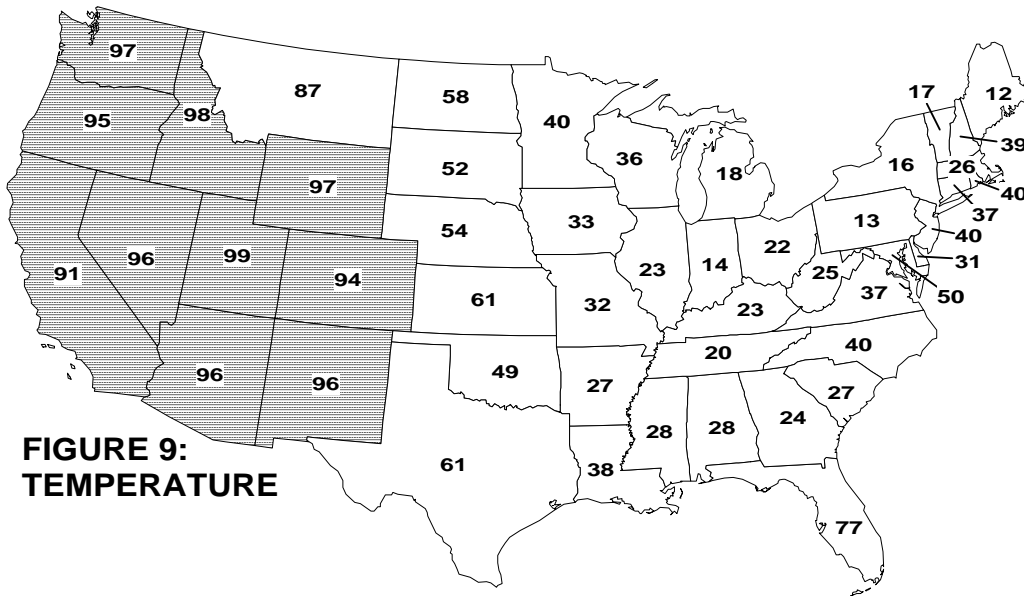
**FIGURE 8:
PRECIPITATION**

1 = Coldest/Driest
100 = Warmest/Wettest

National Climatic Data Center, NOAA

Temperature and Precipitation Ranks for the contiguous United States. Each state is ranked based on its data from 1895-1994. States having a rank of top ten coldest or driest (rank 1-10) or top ten warmest or wettest (rank 91-100) are shaded.

JAN-OCT 1994 STATEWIDE RANKS



National Climatic Data Center, NOAA

Temperature and Precipitation Ranks for the contiguous United States. Each state is ranked based on its data from 1895-1994. States having a rank of top ten coldest or driest (rank 1-10) or top ten warmest or wettest (rank 91-100) are shaded.

U.S. PERCENT AREA DRY AND WET JANUARY 1988 THROUGH OCTOBER 1994

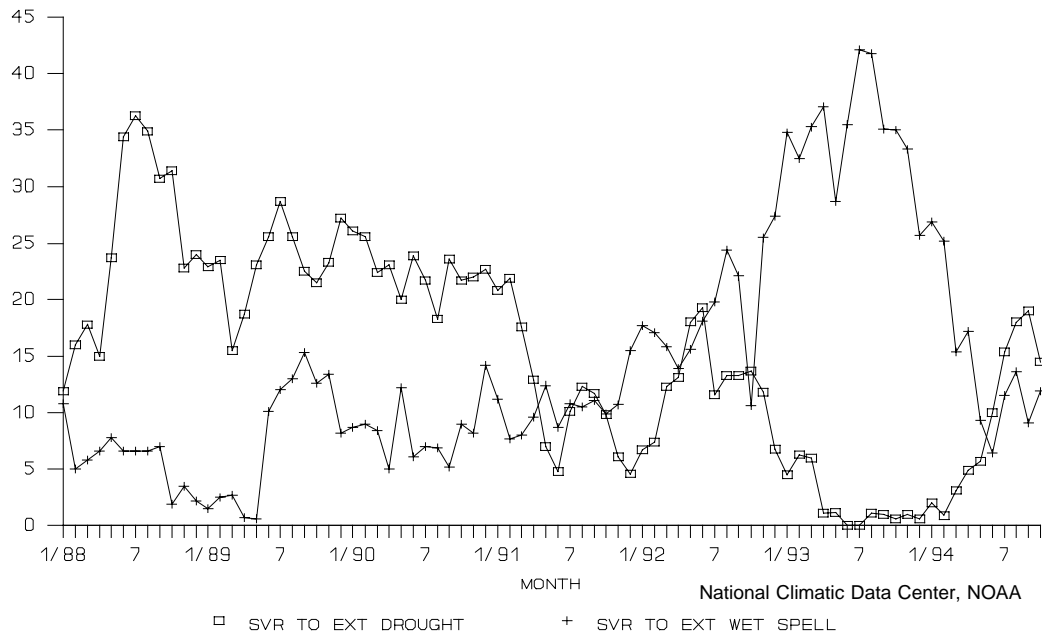
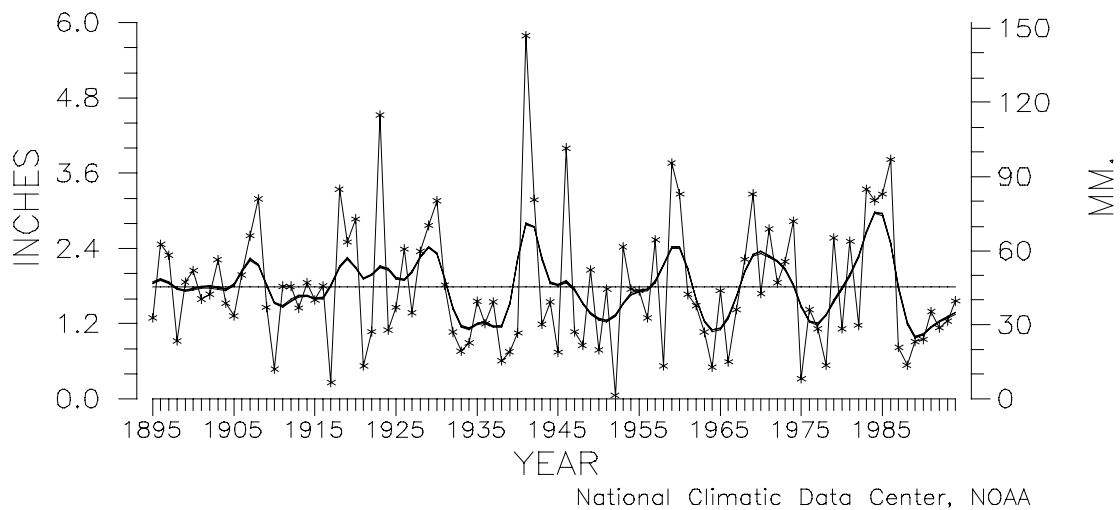


Figure 11

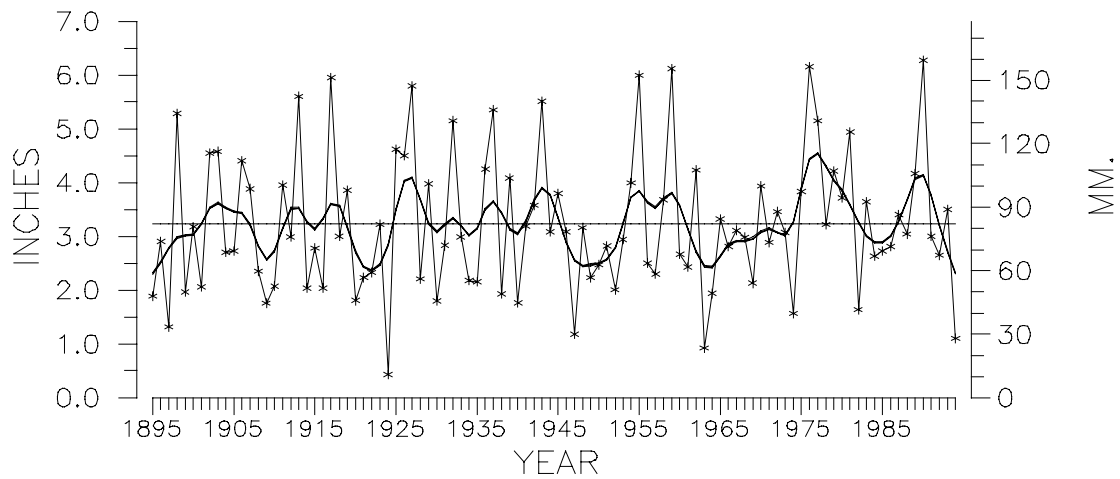
PRIMARY HARD RED WINTER WHEAT BELT PRECIPITATION OCTOBER, 1895–1994



THICK SMOOTH CURVE
IS 9-POINT BINOMIAL
FILTER.

Figure 12

NORTHEAST REGION PRECIPITATION OCTOBER, 1895-1994

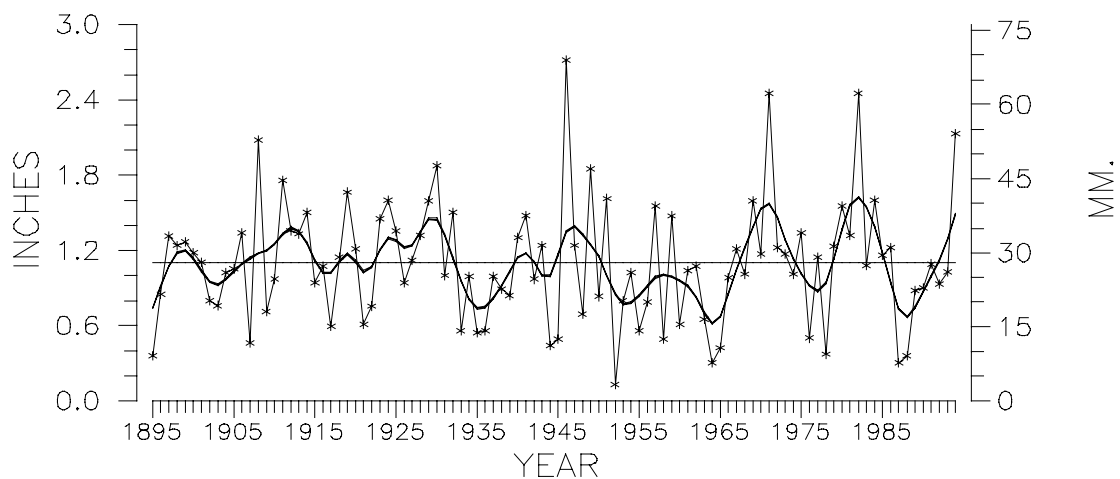


National Climatic Data Center, NOAA

THICK SMOOTH CURVE
IS 9-POINT BINOMIAL
FILTER.

Figure 13

WEST-NORTH CENTRAL REGION PRECIPITATION OCTOBER, 1895-1994

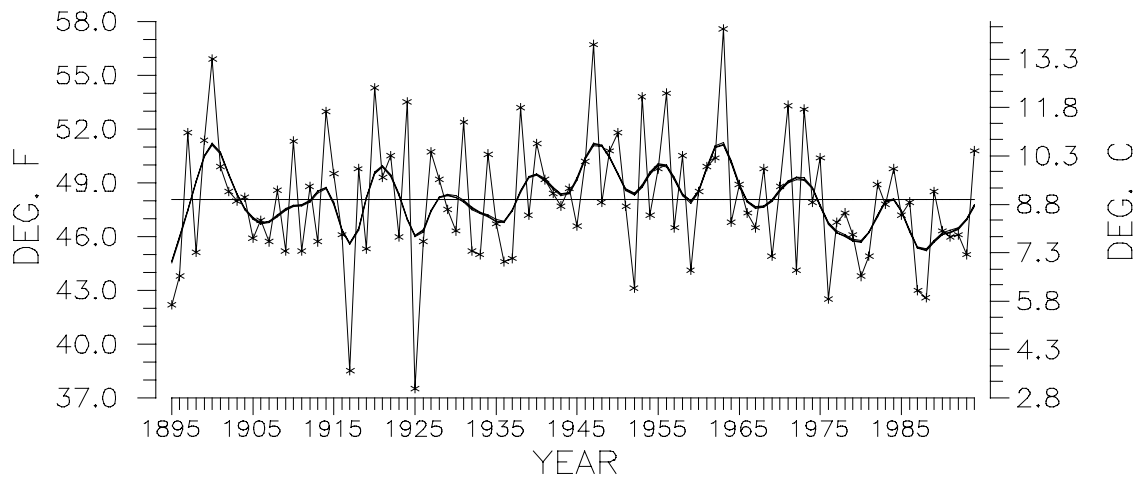


National Climatic Data Center, NOAA

THICK SMOOTH CURVE
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FILTER.

Figure 14

EAST-NORTH CENTRAL REGION TEMPERATURE OCTOBER, 1895-1993

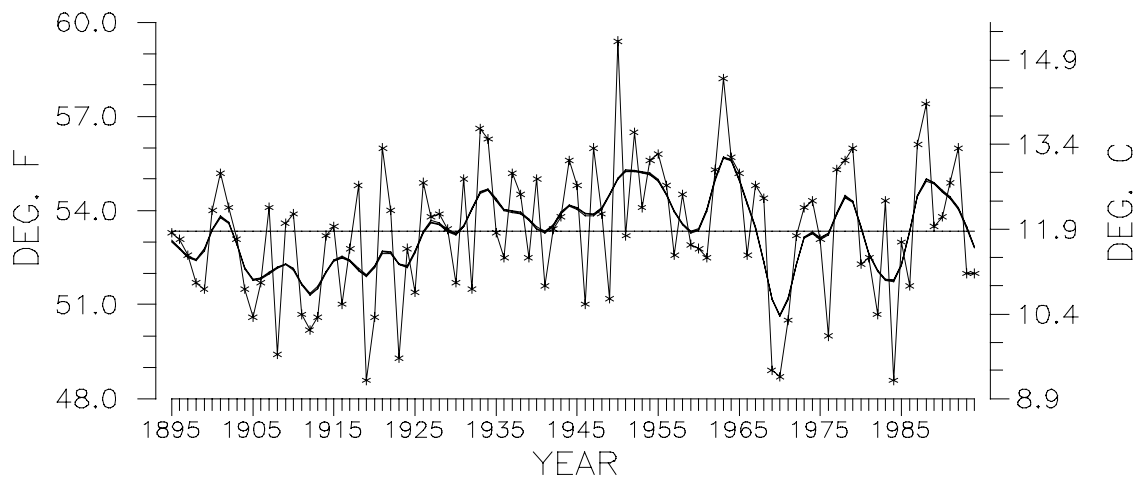


National Climatic Data Center, NOAA

THICK SMOOTH CURVE
IS 9-POINT BINOMIAL
FILTER.

Figure 15

SOUTHWEST REGION TEMPERATURE OCTOBER, 1895-1993



National Climatic Data Center, NOAA

THICK SMOOTH CURVE
IS 9-POINT BINOMIAL
FILTER.

Figure 16